



Arc melting in the Advanced Fuel Cycle Initiative (AFCI) glovebox supports fabrication of experiments for irradiation at reactors such as the Advanced Test Reactor.

Fuel Manufacturing Facility

Fuel Fabrication, Nuclear Material Management

The Fuel Manufacturing Facility (FMF) is a nuclear facility that consists of multiple workrooms and a material storage vault. This facility complements a host of capabilities within the Materials and Fuels Complex at Idaho National Laboratory, the nation's lead nuclear energy research lab.

FMF was constructed in 1986 for the purpose of housing binary (i.e., uranium and zirconium) fuel and its associated equipment to fabricate the driver fuel for the Experimental Breeder Reactor-II (EBR-II). With the shutdown of the EBR-II reactor, this equipment was removed and the focus at FMF transitioned to research and development (R&D) of transuranic metallic and ceramic fuels. Additionally, the material storage vault

contains and supplies various INL and off-site facilities with feedstock materials

KEY EQUIPMENT/ CAPABILITIES:

4 inert gloveboxes

- Advanced Fuel Cycle Initiative (AFCI) glovebox
 - » Provides the capabilities to develop transuranic metallic and ceramic fuel experiments for irradiation
 - » Feedstock production/purification
 - » Characterization sample fabrication
 - » Equipment includes:
 - Arc melter
 - Distillation/tube furnace
 - Sintering furnace
 - Orbital welder
 - Ceramic powder mixing/pressing equipment
- Neptunium repackaging glovebox (NRG):
 - » Provides the capability to recertify neptunium packages for transport to other DOE facilities
 - » Supports material inspection/inventory
- Special nuclear materials (SNM) glovebox:
 - » Provides the capability for legacy uranium material recovery for reuse
 - » Supports uranium material inspection/inventory/breakouts
 - » Uranium roasting and casting capabilities

Material processing in the special nuclear material (SNM) glovebox is part of an ongoing material disposition program that supports work at INL and other DOE labs.



- Transuranic breakout glovebox (TBG)
 - » Supports transuranic material inspection/inventory/breakouts

Radiography

- Provides the capability for verification of experiment fabrication requirements such as fuel placement and rodlet/capsule welding

Vault storage

- Receipt and storage of programmatic materials

The Fuel Manufacturing Facility (FMF) is a hazard category 2 nuclear facility that consists of multiple workrooms and a material storage vault. The workrooms house the equipment utilized to support multiscale fuel development. The vault contains and supplies the feedstock materials used for numerous programs in multiple facilities at MFC.

BASIC CAPABILITIES:

- Transuranic metallic and ceramic fuels development
- Transuranic and enriched-uranium materials storage
- Transuranic and enriched-uranium feedstock production, purification and breakouts

KEY INSTRUMENTS:

- Gloveboxes:
 - » Advanced Fuel Cycle Initiative glovebox (AFCI)

- Experiment assembly
- Ceramic processing
- Metal processing
- Feedstock distillation/purification
- » Special nuclear materials (SNM) glovebox
 - Roasting
 - Casting
 - Feedstock breakout
- » Neptunium repackaging glovebox (NRG)
 - Recertification of neptunium packages
- » Transuranic breakout glovebox (TBG)
- Radiography
- Vault storage
- Active-well neutron center
- Arc-melting furnace
- Distillation furnace
- Sintering furnace

FOR MORE INFORMATION

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